that much more stringent legislation is required for those streams which have not as yet been defiled, than for those which have been for many years in a polluted condition. I also am of opinion that some of the standards of purity are too loose, and others too stringent.

Professor MILLS said: As regards the hardship to individual manufacturers. No doubt there are many cases that would necessarily arise, especially in the case of manufacturers who have standard processes which have been going on for a great many years, and resulting in a great deal of pollution; they cannot be expected to reform these in a short time. I certainly think, in a vast majority of cases, that the pollution might be very fairly dealt with by an Act of this description; and in the majority of cases there would be no hardship. If I were about to set up a dye works, such as exist in the Vale of Leven, I should prefer to do so in the heart of Glasgow. I am quite certain that any pollution I should produce would be more leniently dealt with in any future bill, than it would be if I had gone to the outskirts of Glasgow. I think that we neglect sea water in a great many towns not far from the sea, that greatly pollute rivers, where it would be easy to pump up water to wash down the impurities. Then, again, after all that has been said and done, there will be cases of extreme hardship, and cases with which the scientific chemist cannot immediately deal. I think if there was a court of appeal to certify the cases that are exceptional, and a committee of experts appointed by the Home Secretary to see what could be done, that it would meet this difficulty fairly well. It has been thought desirable by the Council of the Society that we should come to some resolution on the matter; and as there is, I think, a general consensus of opinion that such an Act is necessary, although not perfect as regards detail, I therefore propose for your acceptance the following resolution: "That, although this meeting considers the subject proper for legislation, it does not approve of 'The Proposed Rivers Pollution Bill,' in many of its clauses, and instructs the committee of the Section to make such communications, as it may see fit, to the General Council of the Society."

Dr. WALLACE, in seconding the resolution, said: This resolution does not bind us in any way. It is simply an expression of what we have virtually decided upon—that the Bill, although good in the main, is imperfect in many of its details. It only commits us so far as that; and we, as a meeting, throw the matter upon the committee to report to the General Council in London upon the subject. The General Council have asked our opinion on this subject, and the least we can do is to give them the benefit of our counsel and advice.

Mr. STANFORD, in putting the resolution to the meeting, said: I would simply add that I am quite sure the committee will do their best to put the prominent points that we object to in this Bill before the General Council. I would mention one particular with regard to the standards, that although some of them have been proved by Dr. Wallace to be high (I allude to the carbon and nitrogen), those for the acids and alkalis are far too low. No one would dream of running a waste liquor into the river having anything like the acidity or alkalinity allowed by the Bill. It is remarkable that while so much is said about quality, nothing is said as to quantity, thus, as Dr. Wallace has already said, evasions can very easily be carried out. He fancied, probably, that they would not be, but my impression is that they would. There is no doubt that nothing can be easier than to pump a large amount of water from the river to dilute the effluent down to these standards and thoroughly come under the Act, and yet at the same time pass the same amount of pollution into the river. That appears to have been overlooked by the authorities. But why should we have any standards at all? It appears to me that a simpler way would be to require every one to put back into the river the water he drew from it in no worse state than he got it. With regard to the case of the Bradford Beck, to which allusion has already been made, it does seem absurd that the Corporation should have been interdicted for several years from passing their sewage into that river when it was thoroughly well proved that it would have made the river half as good again. My own opinion goes in favour of the suggestion made by one of the speakers in London, that we should go back to the Rivers Conservancy Boards. I think the rivers do want looking after, and would, in my opinion, be better looked after by a Board which does nothing else.

The motion on being put to the meeting was unanimously adopted.

Obituary.

SIDNEY GILCHRIST THOMAS.*

BORN APRIL 1850; DIED FEBRUARY 1, 1885.

WE regret to announce the death, at Paris, on Sunday morning, February 1, of Mr. Sidney Gilchrist Thomas, to whose genius and untiring labours the basic Bessemer process chiefly owes its existence. In him the metallurgical world has lost a bright and useful ornament.

Sidney G. Thomas was born in April, 1850, and was educated chiefly at Dulwich College, with a view of entering the medical profession. His father's death, however, rendered this impossible, and at the age of seventeen he entered the civil service. Though his position was connected with the administration of the law, a legal training was not a necessity; but it is an illustration of the thoroughness which characterised him that he devoted a considerable time to the regular study of law, in order, as he thought, to be better qualified for his daily work. His predilections, however, lay in a scientific direction, and to chemisty and metallurgy he was specially devoted. Engaged during the day, his only opportunites of study were in the evenings. A small laboratory at home was the scene of much of his study, in which he obtained further guidance by attendance at the laboratories of Mr. Arthur Vacher, of Great Marlborough Street, and of Mr. George Chaloner, of the Birkbeck Institution. However, Sidney Thomas was really an outcome of the admirable system of popular scientific instruction organised by the Science and Art Department.

It was in 1870, while attending a course of lectures on metallurgy at the Birkbeck Institution, that the idea of dephosphorisation first took strong hold upon his mind. To use an ex-

* For the matter of this obituary, the Editor is mainly indebted to the excellent article in *Iron*.

pression which at that time he was fond of quoting, "the man who eliminates phosphorus by means of the Bessemer converter will make his fortune"; and the commercial idea here expressed was quite as much in his thoughts as the scientific nature of the problem. In early conversation on the subject he frequently used to point out the product of a royalty of sixpence a ton on 3,000,000 tons annually of Cleveland pig. He proceeded in a strictly logical manner in the study of his chosen subject. Collecting all the data, both chemical and practical, he came to the conclusion, as Gruner had done, that the acid lining of the converter was the great enemy of dephosphorisation, and from this to the idea of a basic lining was a natural step. True, lime linings had been used in puddling furnaces before 1850. But the difficulty always had been to make them stand. Numerous experiments appeared to show that a small admixture of silicate of soda with lime, or magnesian lime, or Portland or Roman cement, would give good results, and about 1876 Thomas obtained the able assistance of his cousin, Percy C. Gilchrist, who was then chemist at the Cwm-Avon works, but soon after went to Blaenavon, where an immense number of experiments was tried. He systematically theorised and planned experiments, keeping up a continual correspondence with his cousin, who carried them out, besides working independently and conferring with him. His brief occasional holidays were spent in running down to South Wales and supervising the more important ones, and it was on one of these scientific journeys that the seeds were sown of the lung weakness which enfeebled his later years. In November, 1877, Thomas took out his first patent, the complete specification being filed on May 21 subsequently. Events, however, moved with him so quickly that in July 2, 1878, he says: "I regard it as somewhat out of date," and, as a matter of fact, patent succeeded patent up to the present year.

Matters up to this time had, of course, been kept very secret. He had but two or three confidants, but the need for experiments on a larger scale led him to seek the aid of Mr. Martin, the manager of Blaenavon, who enabled the experimenters to work with converters holding as much as half a ton, while at Dowlais, through the courtesy of Mr. Menelaus, a few blows were made with a 5-ton converter. On March 28, 1878, the first public announcement was made to the Iron and Steel Institute. Mr. I. Lowthian Bell had read a paper on the separation of phosphorus from pig-iron in a furnace lined with oxide of iron. Sidney Thomas was present as a visitor, and during the discussion made the following memorable remarks: "It may be of interest to members to know that I have been enabled, by the assistance of Mr. Martin, at Blaenavon, to remove phosphorus entirely by the Bessemer converter. Of course, this statement will be met with a smile of incredulity, and gentlemen will scarcely believe it, but I have the results in my pocket of some hundred and odd analyses by Mr. Gilchrist, who has had almost the entire conduct of the experiments, varying from the very small quantity of 6 lb. up to 10 cwt., and the results all carry out the theory with which I originally started, and show that in our worst cases 20 per cent. of phosphorus was removed, and in our best I must say that 99·9 was removed, and we hope we have overcome the practical difficulties that have hitherto stood in the way." It may be mentioned in this place that, although several persons worked at basic processes before Thomas, not a ton of metal was made by such processes before 1878. Then Thomas devoted his life to it, and, in 1884, 864,000 tons were made. His foreign patents proved a source of great profit, while in England but a small return has been made. The United Kingdom as a whole has contributed a mere trifle to the money rewards of the inventors of the basic process.

The exertion of constant travelling, combined with the anxiety of perpetual work, ultimately, however, ruined Thomas's health, which was never very robust. In 1882 he was ordered to pass the winter in Australia, whither he went viâ India, and returned through the United States. On this journey, however, he did much work, and came back in the early summer as full of ideas as ever. He only stayed in England a few months, and in September left again for Algeria, tended by an affectionate mother and sister, who had broken up their home to solace his exile. At Bir el Droodj he set up his habitation, including a laboratory, and worked away at the utilisation of phosphoretic slag and other problems. Last summer he moved north to Paris, where he submitted himself to a method of treatment which promised good results, but the improvement was only apparent, and the busy brain ceased its labours on the morning of Sunday, February 1.

Sidney Gilchrist Thomas was a man of high moral worth, and great amiability and kindness. Though never married, he was the central figure of a happy family, comprising a widowed mother, an only sister, and a younger brother. When success could no longer be denied him, he received the highest honours among metallurgists, but he received them with true modesty.

Journal and Patent Literature.

I.—GENERAL PLANT, APPARATUS, AND MACHINERY.

Improvements in Filter-Presses. B. H. Remmers, Glasgow. Eng. Pat. 2978, February 8, 1884.

THE object of this invention is to facilitate the lixiviation of the solid matter collected in a filter-press before its removal from the apparatus. Instead of forming the channels which convey the washing water to the interior of the press in projecting portions or lugs outside the chambers, the patentee forms them in the corners of the chambers, such ducts being formed by the immediate contiguity of holes formed in the rims of the plates. The ordinal numbered chambers communicate with one passage so formed by means of small T-shaped cores, and the cardinal numbered plates communicate with the other passage by similarly shaped cores. Any liquid admitted into the chambers by one of these passages can only leave the apparatus, when the ordinary outlet cocks are shut, by the other channel, to arrive at which, the liquid must in its course pass through the chambers and their contents, and thus removes the soluble constituents in its passage. The patentee claims as novel the construction of the passages, as described, in the corners of a filter-press chambers for the purpose set forth.—C. C. H.